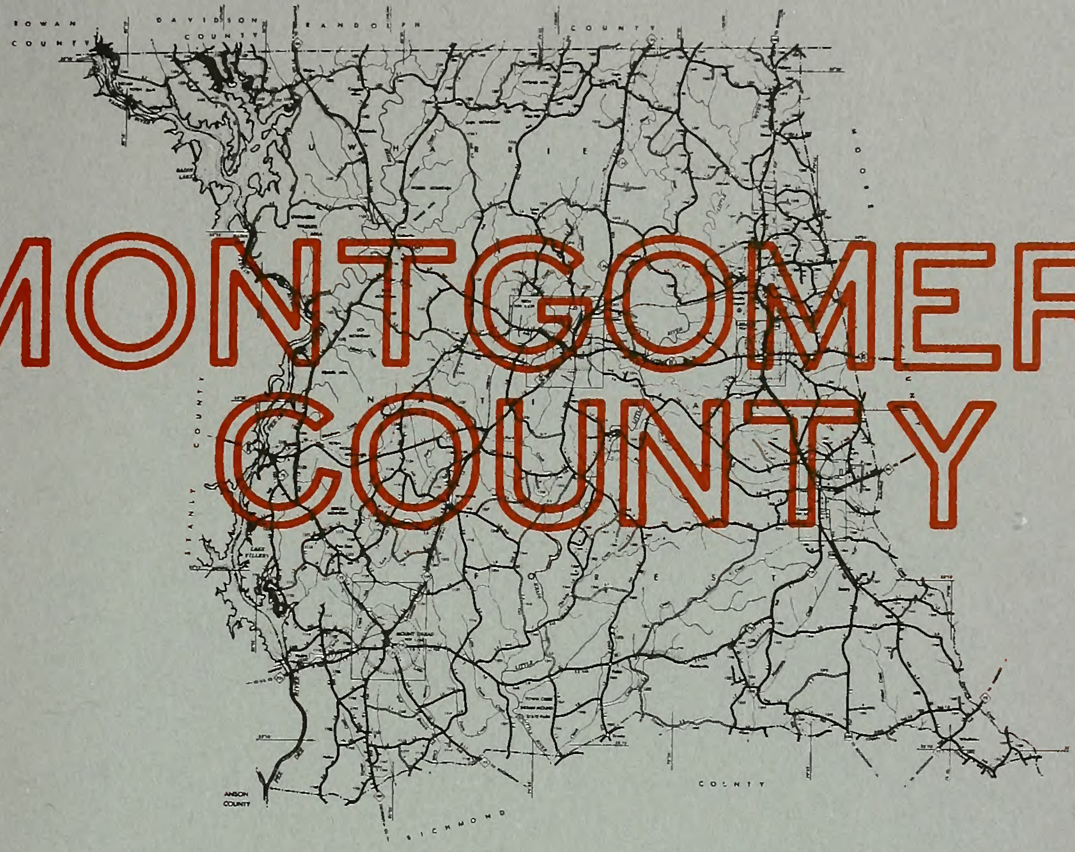
K4
11/2:M78
c. 2

North Carolina State Library
Raleigh

N. C.
Doc.

MONTGOMERY COUNTY



JUL 23 1981

TRANSPORTATION PLAN

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PRELIMINARY TRANSPORTATION PLAN
for
MONTGOMERY COUNTY, NORTH CAROLINA

Prepared by the:

Thoroughfare Planning Unit
Planning and Research Branch
Division of Highways
North Carolina Department of Transportation

In cooperation with:

Federal Highway Administration
U. S. Department of Transportation

December, 1978

Manager of Planning and Research: T. L. Waters
Thoroughfare Planning Engineer: Marion R. Poole
Project Engineer: Michael L. Tewell, Jr.
Project Coordinator: Robert T. Blackwood
Graphics Assistant: Janie Edwards
Typist: Delwyn King

I. INTRODUCTION

The economic and social well-being of a region is largely dependent upon an adequate overall transportation system. Unless people and goods are able to move from one place to another quickly and conveniently, the area becomes dormant and unable to develop to its full economic potential. Realizing the key role that highways play in this transportation system, it has become increasingly necessary to develop a good continuous network of national, state, and regional highways which can efficiently handle present and anticipated traffic needs.

Montgomery County, in recent years has been increasing its demand on its existing highway network. A growing number of people who live in remote sections of the county, work in or around the cities or towns, hence becoming dependent upon automobile travel. Better farm-to-market roads are becoming more in demand. Also, there are many recreational opportunities available in the county, which should increase the tourism trade and place even heavier demands on the county's highway network. The need for a long range plan which will integrate the many different classes of roads within the county into an efficient, safe, and convenient highway system has become necessary.

The proposed system of thoroughfares was developed following the basic principles of thoroughfares planning as described in Section II of this report. Thoroughfares were located based upon field investigations, existing and anticipated land use and population distribution, and topographic conditions. The plan advocates those improvements which are felt to be essential for proper traffic circulation within the current planning period (1977-2000). The plan does not attempt to modify proposed municipal thoroughfare plans already developed for the towns of Troy, Biscoe, Star, and Mount Gilead.

Proposed improvements within the county plan will be primarily the responsibility of the North Carolina Department of Transportation. However, Montgomery County through the use of subdivision and zoning controls can do much toward the implementation of the plan. Thus, it is desirable that the plan be formally approved by both the county and the Department of Transportation to serve as a mutual official guide in the development of the thoroughfare system.

II. COUNTY THOROUGHFARE PLANNING PRINCIPLES

Purpose of Planning

There are many benefits to be gained from thoroughfare planning, but the primary objective is to assure that the road system will be progressively developed in such a manner as to adequately serve future travel desires. Thus, the cardinal concept of thoroughfare planning is that provisions be made for street and highway improvements, as well as other modes of transportation, so that as needs arise feasible opportunities to make improvements exist.

The major benefits derived from thoroughfare planning are: (1) Each road or highway can be designed to perform a specific function and to provide a specific level of service. This permits savings in rights-of-way, construction, and maintenance costs, protects residential neighborhoods, and encourages stability in travel and land use patterns. (2) Local officials are informed as to future improvements. Developers can design subdivisions to function in a non-conflicting manner. School and park officials can better locate their facilities. Irretrievable damage to property values and community appearance, as is sometimes associated with improvements programs, can be minimized.

County Thoroughfare Planning Concept

Streets, roads, and highways perform two primary functions--they provide traffic service and land service. These two functions when combined are basically incompatible. The conflict is not serious if both traffic and land service demands are low. But when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property result in intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets, roads and highways which permit travel from origins to destinations with directness, ease and safety. Different elements in the system are designed and called on to perform specific functions and levels of service, thus minimizing the traffic and land service conflict.

Within the county plan, elements are considered to be either urban or rural. In the urban planning area, the local municipality generally has planning jurisdiction. Outside

Digitized by the Internet Archive
in 2011 with funding from
State Library of North Carolina

http://www.archive.org/details/preliminarytrans1978nort

the urban planning area, the county has planning jurisdiction. In those urban areas where no urban thoroughfare plan has been developed, elements are generally considered to be rural and under the planning jurisdiction of the county. When a thoroughfare plan is developed for an urban area that has not previously had a plan, then the area defined by that plan would be considered urban and come under the planning jurisdiction of the municipality.

Within the urban and rural systems, thoroughfare plan elements are classified according to the specific function which they are to perform. A discussion of the elements and functions of the rural system follows:

Rural Thoroughfare Classification System

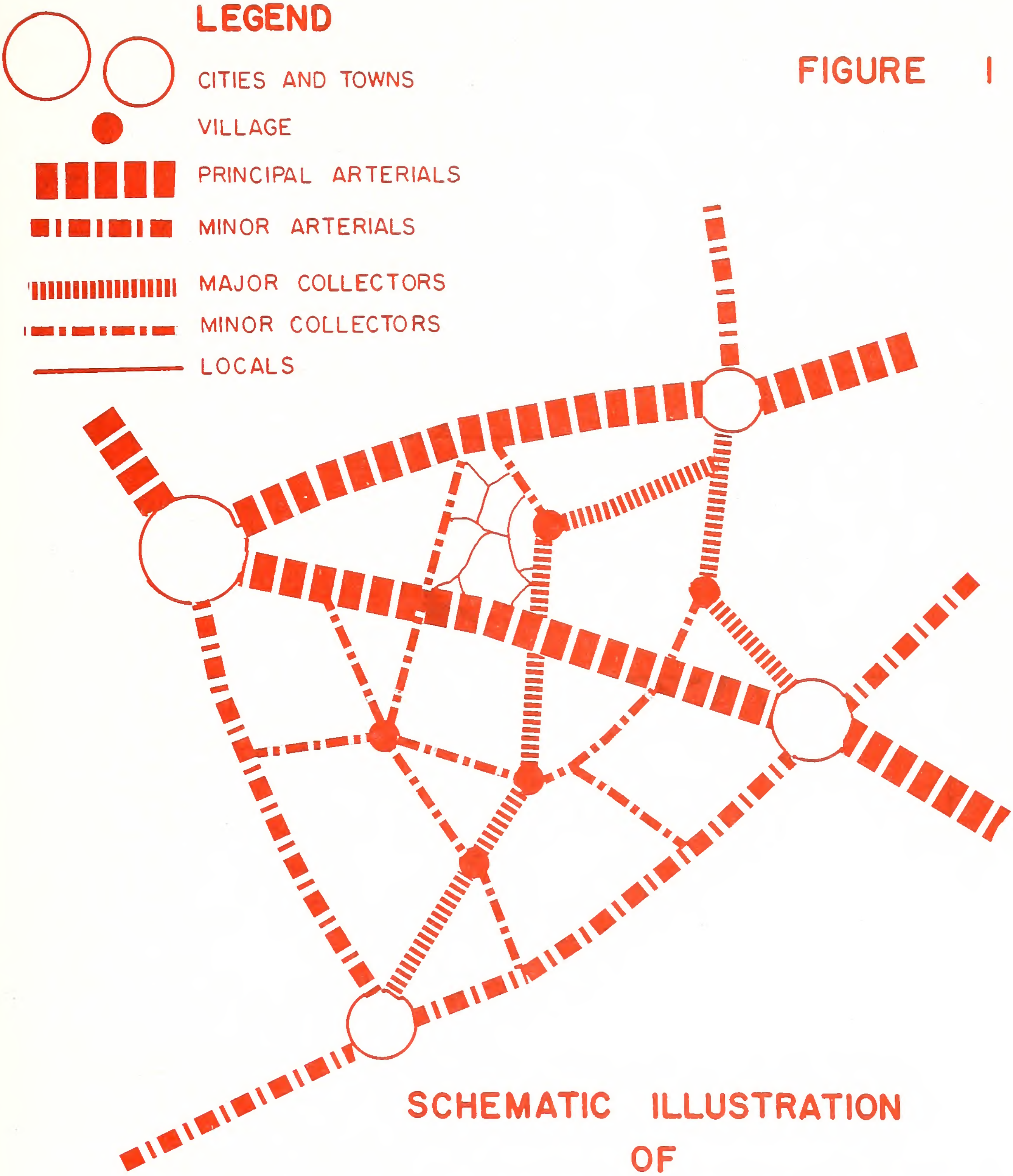
The rural system consists of those facilities outside the urban thoroughfare planning area boundaries. They are classified into four major systems: principal arterials, minor arterials, major and minor collector roads, and local roads. Table 1 indicates generally accepted statewide mileage on these systems.

Table 1. Rural System Road Mileage Distribution

Systems	Percentage of Total Rural Miles
Principal arterial system	2-4
Principal arterial system plus minor arterial road system	6-12
Collector (major plus minor) road system	20-25
Local road system	65-75

Figure 1 gives a schematic illustration of a functionally classified rural highway system.

FIGURE I



SCHEMATIC ILLUSTRATION OF FUNCTIONALLY CLASSIFIED RURAL HIGHWAY NETWORK

Rural Principal Arterial System: The rural principal arterial system consists of a connected network of continuous routes which serve corridor movements having trip lengths and travel density characteristics indicative of substantial statewide or interstate travel. The principal arterial system should serve all urban areas of over 50,000 population and a large majority of those with a population greater than 5,000. The Interstate System constitutes a significant portion of the principal arterial system.

Rural Minor Arterial System: The minor arterial system in conjunction with the principal arterial system forms a network which link cities, larger towns, and other major traffic generators such as large resorts. The minor thoroughfare system generally serves interstate and intercounty travel and serves travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

Rural Collector Road System: The rural collector routes generally serve travel of primarily intracounty rather than statewide importance and constitute those routes on which predominant travel distances are shorter than on the arterial routes. This system is subclassified into major collector roads and minor collector roads.

> Major Collector Roads: These routes (1) provide service to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, important mining and agricultural areas, etc.; (2) link these places with nearby larger towns or cities, or with routes of higher classification; and (3) serve the more important intracounty travel corridors.
>
> Minor Collector Roads: These routes (1) collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; (2) provide service to the remaining smaller communities; and (3) link the locally important traffic generators with their rural hinterland.

Rural Local Road System: The local roads comprise all roads not on one of the higher systems.

III. MONTGOMERY COUNTY-PAST, PRESENT, AND FUTURE

Montgomery County, an area of 488 square miles, is located almost entirely within the Piedmont Region of the state (Figure 2). The southeast corner of the county is located in the Sandhills Region. The topography on the western border above the Yadkin-Pee Dee River consists of steep slopes and fast moving streams. The Uwharrie Mountain range cuts across the northwestern section of the county. The remainder of the Piedmont Region within the county consists of rolling foothills. The Sandhills Region is within the remnants of a beach left when the ocean receded in this area eons ago. This area is exemplified by gentle sandy swells stretching out into large flat areas as one travels eastward out of the county and into the Coastal Plain Region.

Montgomery County is bounded to the west by the Little Pee Dee and Yadkin Rivers. It has the shape of a diamond that is laying on its side pointing toward the northwest. The county is bordered by Moore County to the east, Richmond County to the south, Stanly County to the west, and Davidson and Randolph Counties to the north.

Population Trends

The population of Montgomery County has declined only once in any decennial census period. This decrease occurred from 1910 to 1920. There was a 2.4 percent drop, but since then the population has steadily increased from 14,607 in 1910 to 19,267 in 1970. The county has five municipalities, the largest being Troy, which had a population of 2,429 in 1970. The U. S. Bureau of Census lists 100% of the 1970 population as rural with no urban population designated. This compares with a 55 percent statewide rural population.

Upon completion of the U. S. 220 relocation in the eastern section, the 30 or so industries within the county can be expected to expand. The vast amount of unused land designated as national forest will attract new residents looking for a peaceful place to live, work and recreate. On the basis of this and past trends, it is expected that the population will continue to increase moderately between 1970 and 2000. The estimated county population in the year 2000 is 22,000.

GEOGRAPHIC LOCATION

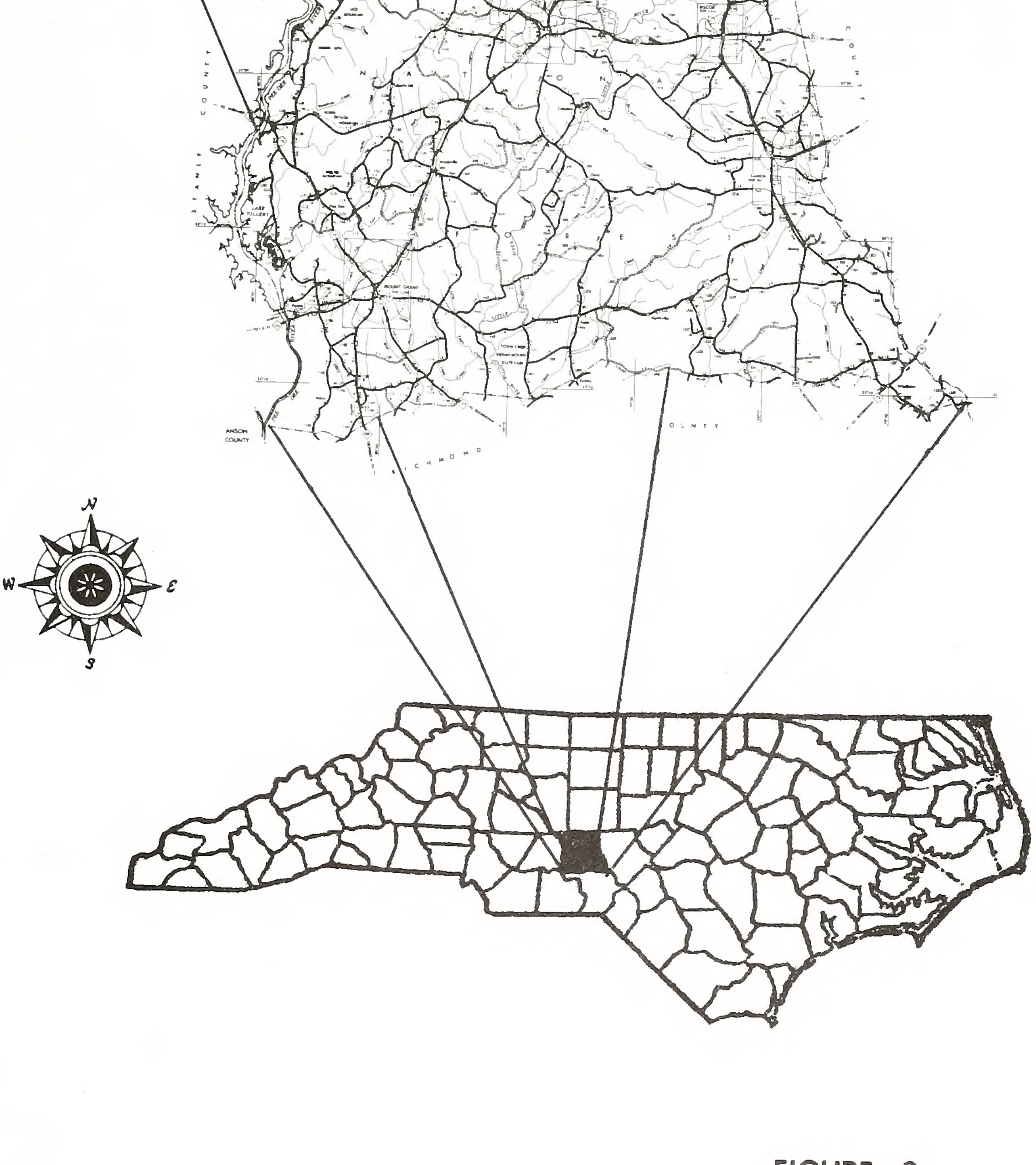


FIGURE 2

Land Use

As indicated by the 1970 census, the county is rural by nature. The major commercial shopping areas in the county are those immediately surrounding the Towns of Troy, Mount Gilead, Star, Biscoe, and Candor. Growth is expected to continue around these towns, plus along existing US 220 and around the interchanges of the new US 220.

In recent years, the county has become more active in seeking additional diversified industrial development plus textile manufacturing plants. The county had been hindered in the past by the lack of facilities; now however, the county is progressing rapidly on a countywide water system which should make it a more favorable location for new development.

Recreational land and activities are located throughout the county. The Uwharrie Game Management Area and the Morris Mountain Big Game Restoration areas offer excellent hunting preserves, with picnic areas open year round. For the fisherman and water sports enthusiast, there are four large hydroelectric reservoirs in addition to the Yadkin and Little Pee Dee Rivers. Even with all this, much of the recreational land in the county remains untouched.

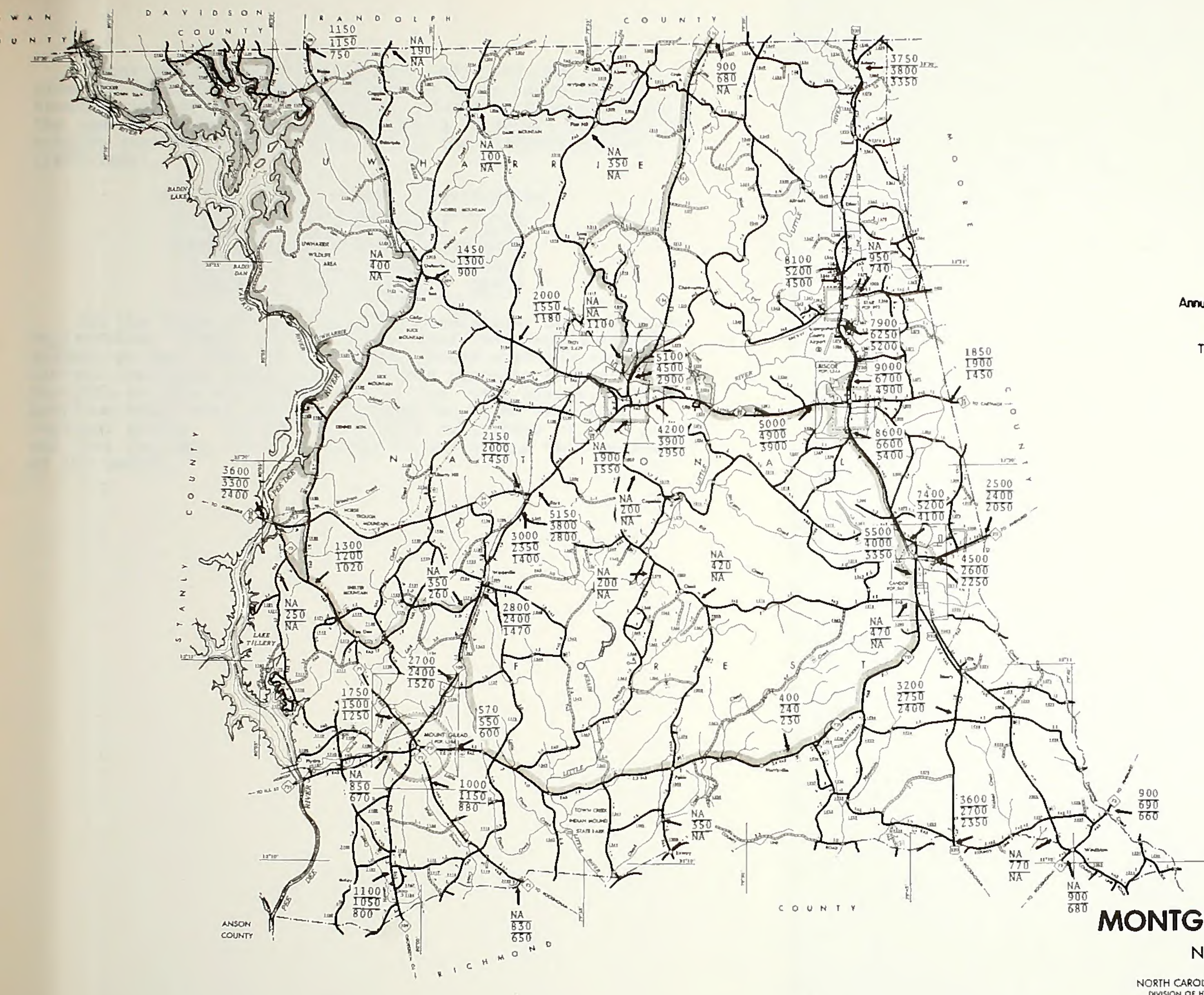
If additional information is desired concerning Montgomery County land use, a comprehensive land development plan for the county was compiled in March, 1974. This plan was done by the N. C. Department of Natural and Economic Resources[1], Division of Community Services. Copies are available at the County Courthouse in Troy.

Traffic

A comparison of 1967, 1972, and 1977, average annual daily traffic (ADT) volumes on selected major roads and highways in Montgomery County are shown in Figure 3. The only road experiencing a significant enough change to warrant attention is is US 220 through Star and Biscoe. This problem will be alleviated, however, as soon as US 220 relocation is completed.

---

[1] The department's name has been changed to Natural Resources and Community Development.



Annual Average Daily

Traffic Volumes

LEGEND

1977	0000
1972	0000
1967	0000

FIGURE 3

MONTGOMERY COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS – PLANNING AND RESEARCH BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Motor vehicle registration for 1967, 1972, and 1977 is given in Table 2. Both automobile and truck registration steadily increased over the period. Based on this trend and the expected moderate population growth, a modest increase in vehicle registration may occur during the planning period (1977-2000).

Table 2. Motor Vehicle Registration

Year	1967	1972	1977
Autos	7035	8878	10601
Trucks	2230	2727	3807

On the basis of the forecasted population, motor vehicle registration trends, ADT trends and land use trends, traffic volumes on most roads in the county should experience only minimal increases during the 1977-2000 planning period. Exceptions to this would be US 220 or the Star, Biscoe, Candor corridor which will continue to experience the imoact of regional growth. The new US 220 will contribute to this growth and thus increase traffic volumes in and around this section of the county.

IV. ANALYSIS OF EXISTING MAJOR ROAD SYSTEMS

An assessment of the existing highway network outside the urban planning areas was made to determine if it is adequately handling the traffic demands that are placed upon it. One phase of this assessment was a capacity-volume analysis. Based on levels of service (operating speeds), the practical capacities of the major roads in the county were determined. Relating the existing volumes to those capacities, no major existing capacity deficiencies were found.

Estimates of 2000 traffic were made on critical highway sections to determine future capacity deficiencies. These estimates were prepared by projecting historic trends and are given in Table 3. Comparing the projected traffic to available capacities, it is anticipated that no major capacity deficiencies will occur by the design year. If development should occur at a greater rate than anticipated, a reassessment of existing roads will be necessary.

An examination of traffic accident records, furnished by the Traffic Engineering Department of the Department of Transportation, from January, 1973 to April, 1978 reveals a need to further study and take corrective measures at several intersections. Those intersections having 10 or more accidents reported over the stated period within 500 feet of the intersection itself were considered problem areas. These intersections are listed in Table 4.

Table 3

Historical and Projected Annual Average Daily Traffic Volumes for Selected Locations on Montgomery County Highway System

Location	1967	1972	1977	2000[a]
NC 24-27 At Moore County	1450	1900	1900	3100
NC 24-27 At US 220 Bus.	1800	2400	3200	6400
NC 24-27 At SR 1336	3900	4900	5000	8000
NC 24-27 At NC 134	4200	5300	6500	11,800
NC 24-27-109 At SR 1139	3200	6000	b	12,000
NC 24-27-109 At NC 109	2800	3800	5150	10,500
NC 24-27 At SR 1137	1450	2000	2150	3900
NC 24-27 At Stanley County	2400	3300	3600	6500
NC 109 At Randolph County	750	1150	1150	2200
NC 109 At SR 1134	1180	1550	2000	3900
NC 109 At NC 24-27	1400	2350	3000	6800
NC 109 At SR 1127	1520	2400	3500	8000
NC 109 At NC 73	1670	2150	3100	6300
NC 109 At SR 1100	1150	1200	1850	3400
NC 109 At Richmond County	700	900	1100	2000
US 220 Bus. At SR 1353	3350	3700	b	2000[c]
US 220 Bus. At SR 1002	5100	6250	b	4000[c]
US 220 Bus. At NC 24-27	5800	6600	9400	5500[c]
US 220 Bus. At NC 211	4100	4000	7050	4000[c]
US 220 Bypass				12,300[d]
US 220 At SR 1524	2400	2750	3200	5100
US 220 At Richmond County	2450	2700	3600	6200

[a] Estimated

[b] Not available

[c] Estimate based on assumption of 70/30 split between bypass and business route

[d] Average ADT over total project

Table 4

High Accident Rate Intersections
Montgomery County, 1973-1978
(10 or more accidents reported)

Highway Intersections	Number of Accidents Reported
Rural Primary Road System	
1. N. C. 24 At US 220	14
2. N. C. 27 At US 220	19
3. N. C. 211 At US 220	33
Rural Secondary Road System	
1. SR 1519 At US 220	15

There are a number of major roads in the county that have widths of 16 to 18 feet. Standards established by the American Association of State Highway Officials (AASHO) set 20 feet as a minimum width with 24 feet as a preferred width. However, because of the substantial cost of upgrading all secondary roads to AASHO standards, narrower widths are tolerated depending upon traffic volumes (Table 6). The following roads on the thoroughfare plan have inadequate and intolerable width deficiencies according to Table 6.

1. NC 73
    - NC 24-27 to Pee Dee River
    - Ext. C. L. Mt. Gilead to Rich. Co.
2. NC 24-27
    - Stanly Co. to NC 73
3. NC 731
    - E.C.L. Mt. Gilead - SR 1005
    - SR 1524 - US 220
4. SR 1002
    - Moore Co. to SR 1363
    - SR 1363 to Star
5. SR 1003
    - Richmond Co. to Windblow
    - Vicinity New US 220
6. SR 1005
    - Richmond Co. to North of SR 1564

7. SR 1516
   Candor to SR 1005
8. SR 1570
   SR 1005 to SR 1568
9. SR 1568
   SR 1570 to SR 1565
10. SR 1565
    SR 1568 to SR 1543
11. SR 1543
    SR 1565 to NC 731
12. SR 1303
    NC 109 to SR 1134
13. SR 1134
    SR 1303 to SR 1306
14. SR 1306
    SR 1134 to SR 1310
15. SR 1311
    SR 1306 to SR 1349
16. SR 1349
    SR 1340 to SR 1348
17. SR 1310
    SR 1306 to SR 1315
    SR 1315 to NC 134
18. SR 1134
    NC 109 to SR 1130
19. SR 1340
    Star to SR 1323
20. SR 1130
    SR 1134 to SR 1174
21. SR 1128
    SR 1174 to Mt. Gilead
22. SR 1500
    SR 1505 to Biscoe

BRIDGE CONDITIONS

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or defect in a bridge reduces the value of the total investment. Third, a bridge presents the greatest opportunity of all potential highway failures for disruption of community welfare. Finally, and most important, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons it is imperative that bridges be constructed to the same design standards as the system of which it is a part.

Congress enacted the National Bridge Inspection Standards on April 27, 1971, implementing the Federal Highway Act of 1968. The Standards require that all structures defined as bridges located on any of the Federal-Aid Highway Systems shall be inspected and the safe load carrying capacity computed at regular intervals, not to exceed two years. A sufficiency index number has been calculated for each bridge for the purpose of establishing eligibility and priority for replacement. The bridges with the highest priority are replaced as Federal-Aid Funds are made available to the state.

Bridges that are not on the Federal-Aid System were not provided for in the above-mentioned Act, but the North Carolina Bridge Maintenance Unit does have a file on these bridges. They will be inspected if time permits. The North Carolina General Assembly initiated a special fund in 1975 for State bridge replacement. Five million dollars per year has been budgeted since then to replace these deficient bridges by priority.

The North Carolina Bridge Maintenance Unit has also included in the 1979-81 expansion budget a request for additional personnel so that all bridges on the State Highway Systems can be inspected, analyzed, rated, appraised, and inventoried so the resulting data can be reduced to a more readily useable form as a management tool.

On August 11, 1978, there were 130 structures classified as bridges on the State Road System in Montgomery County; 25 on the State Primary System and 105 on the State Secondary System. There were 24 bridges carrying Federal-Aid routes.

Of the 25 bridges on the Primary routes only 2 (8%) were structurally inadequate for weights legal in this State. On the Secondary System, 83 of the 105 bridges (79%) were structurally inadequate for legal weights, and 55 (52.3%) are structurally inadequate for the largest standard school bus purchased by the North Carolina Department of Education. Criteria for bridge geometrics are being revised; therefore, no count of functionally obsolete bridges can be made until these revisions are approved.

V. TRANSPORTATION PLAN

The recommended Thoroughfare Plan for Montgomery County is shown in Figure 4. Elements in the plan are initially classified as either urban or rural. The areas around Star, Biscoe, Troy, and Mount Gilead are delineated as urban planning areas. Urban Thoroughfare plans have either been developed or under development in these areas. Other Urban planning areas would be delineated around other municipalities when additional planning studies are conducted.

Principal Arterials

The principal arterial route in Montgomery County that will serve primarily interstate and statewide travel is US 220. It takes a north-south route through the county. Beginning at Steed it becomes four lane divided and bypasses Ether, Star, Biscoe, and Candor. At Emery it merges back to two lanes and proceeds south out of the county.

Minor Arterials

The minor arterials in conjunction with the principal arterial system form a network which link the cities and larger towns of the region. The minor arterial routes that are included in the plan are as follows:

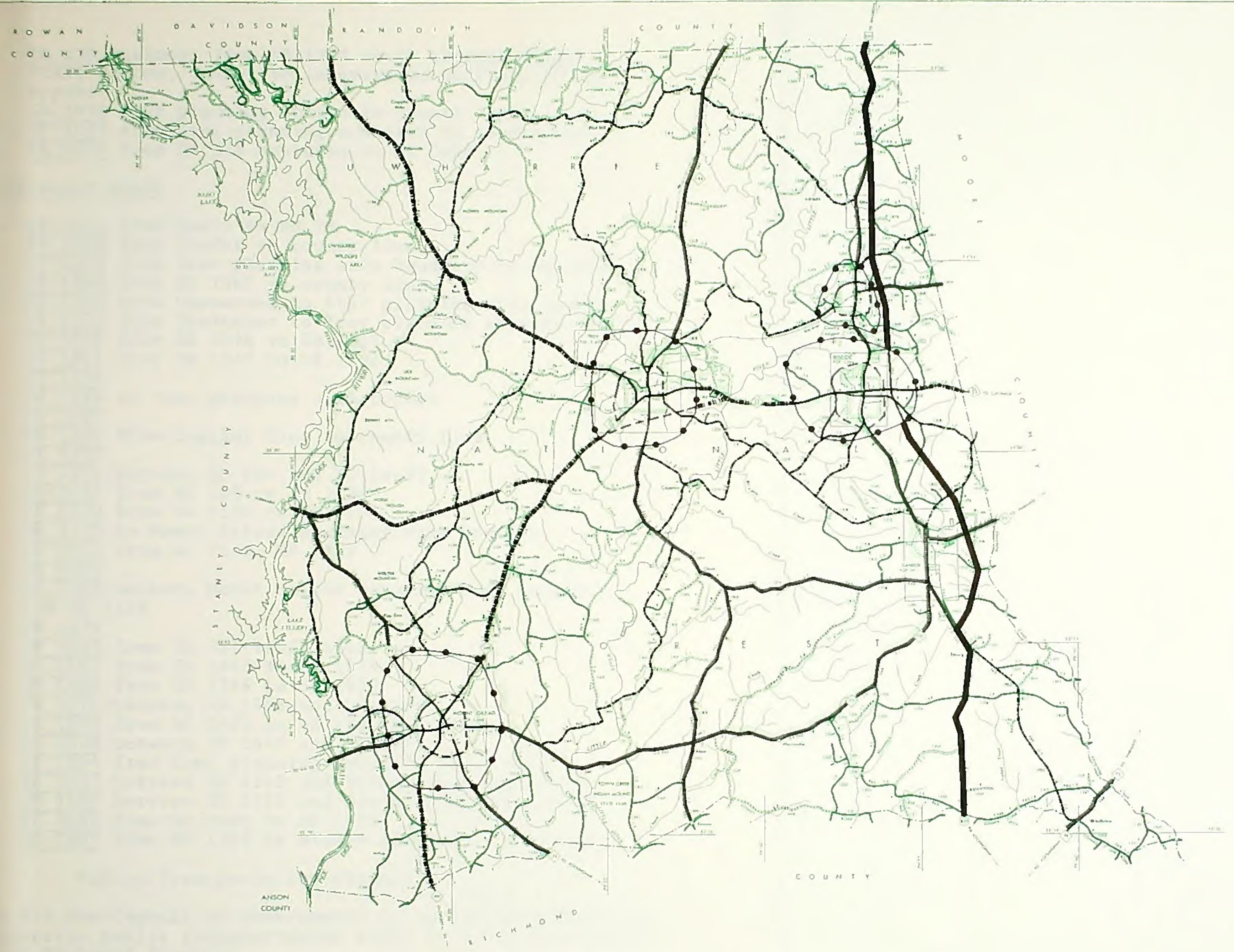
1. NC 109
2. NC 24-27 including a proposed southern bypass around Troy.

Collector Road System

The rural collector routes will serve primarily intra-county travel. The major collector roads will supplement the minor arterial system by providing an inter-connecting network between smaller population centers and connecting the smaller population centers to the arterial routes. The minor collector roads will collect traffic from the local roads and carry it to the higher system roads. Proposed major and minor collector roads in Montgomery County are as follows:

Major Collector Roads

1. NC 73
2. NC 211
3. NC 731
4. NC 134



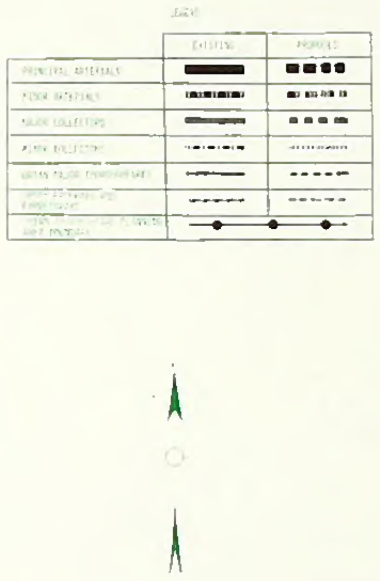


FIGURE 4

THOROUGHFARE PLAN
MONTGOMERY COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS—PLANNING AND RESEARCH BRANCH

SCALE

5. US 220 business from SR 1348 south through Ether, Star, Biscoe, Candor to interchange with new US 220 bypass.
6. SR 1002 Star planning cordon to county line
7. SR 1005 from Troy planning boundary to county line
8. SR 1516 from US 220 business to SR 1005

Minor Collector Roads

1. SR 1003 from Emery to NC 73
2. SR 1509 from Candor to county line
3. SR 1365 from Star planning area boundary to SR 1364
4. SR 1364 from SR 1365 to county line
5. SR 1340 from Okeewemee to Star planning area cordon
6. SR 1323 from Okeewemee to Troy planning area boundary
7. SR 1349 from SR 1348 to SR 1311
8. SR 1311 from SR 1349 to SR 1306
9. SR 1306
10. SR 1310 to Troy planning area cordon
11. SR 1303
12. SR 1301 from Coggins Mine to county line
13. SR 1302
14. SR 1150 between NC 109 and NC 24-27
15. SR 1134 from NC 109 to SR 1130
16. SR 1130 from SR 1134 to SR 1174
17. SR 1128 to Mount Gilead planning area boundary
18. SR 1111 from NC 73 to SR 1110
19. SR 1110
20. SR 1188 between Mount Gilead planning area boundary and SR 1110
21. SR 1174
22. SR 1543 from NC 731 to SR 1565
23. SR 1565 from SR 1543 to SR 1568
24. SR 1568 from SR 1565 to SR 1570
25. SR 1570 between SR 1568 and SR 1005
26. SR 1519 from SR 1005 to US 220 business
27. SR 1578 between SR 1005 and SR 1519
28. SR 1554 from Troy planning boundary to SR 1519
29. SR 1557 between SR 1519 and Biscoe planning cordon
30. SR 1558 between SR 1519 and Biscoe planning cordon
31. SR 1505 from SR 1509 to SR 1500
32. SR 1500 from SR 1505 to Biscoe planning area boundary

Public Transportation Planning

The Pee Dee Council of Governments is currently undertaking a comprehensive public transportation study in Anson, Montgomery, Moore, and Richmond Counties.

Previous studies have indicated that lack of public transportation has been a barrier to economic and social progress in this region, restricting employment opportunities, housing options, and social and recreational participation, particularily for the poor, the elderly, and the handicapped--those population groups most likely not to own or have access to an automobile. Due to the lack of alternative forms of transportation, a number of facilities and institutions have been hampered in the provisions of services, including many human service agencies.

This study will examine possible alternatives for public transportation service in the four county area. The study has five major objectives:

1) to identify target populations who are potential users of public transportation services and identification of potential trips, by purpose, which public transportation could most likely serve;

2) to inventory all existing public transportation and determine the availability of existing transportation resources for use by the general public;

3) to examine current cooperative efforts among human service agencies in the region and to examine the future potential of greater utilization of transportation resources (vehicles and funds) among these agencies;

4) to determine service areas of existing transportation services to evaluate transportation availability by type and township location; and

5) to develop long range public transportation plans based on projections of future needs.

Scheduled Improvements To Thoroughfare System

The North Carolina Highway Improvement Program has been developed and approved by the Board of Transportation, to keep the citizens of North Carolina abreast of current developments in the State's highway system, to emphasize the ongoing nature of highway planning, and to invite local input into the planning process.

The Program is reviewed and updated by the Board of Transportation on an annual basis, and a seven-year project planning schedule has been established. This fourth annual update in 1977, like the original program, provides and ambitious project schedule. Costs were carefully balanced against expected revenues. No funding shortfalls or major project cost overruns were projected.

The following is a list of projects that are scheduled in the Highway Improvement Program for Montgomery County:

1. Biscoe - SR 1500, US 220 to east city limits. Widen to 22 feet, utility relocation, and resurface. (Fiscal year 1978, HIP NUMBER U-558L)

2. Candor - SR 1518, near McCallum Street. Revise vertical grade to improve sight distance. (Fiscal year 1978, HIP NUMBER U-558M)

3. Mount Gilead - NC 731, curb and gutter section to old project #6.803004. (Fiscal year 1978, HIP NUMBER U-558N)

4. Mount Gilead - NC 109 bypass and NC 731 intersection revisions. (Fiscal year 1978, HIP NUMBER U-558O)

5. Mount Gilead - NC 109, NC 73 North towards city limits. Construct 4 foot paved shoulders. (Fiscal year 1978 HIP NUMBER U-558P)

6. Star - SR 1379, SR 1002 to new SR 1002. Widen existing pavement. (Fiscal year 1978, HIP NUMBER U-558Q)

7. Star - SR 1369, US 220 to city limits. Widen existing pavement. (Fiscal year 1978, HIP NUMBER U-558R)

8. Troy - NC 109 Business, NC 134 to Eldorado Street. Replace existing curb and gutter. (Fiscal year 1978, HIP NUMBER U-558S)

9. Troy - SR 1332, NC 134 to Wood Street. Widen existing pavement. (Fiscal year 1978, HIP NUMBER U-558T)

10. NC 24-27 - Replace bridge over Pee Dee River. (Under Construction, HIP NUMBER R-213)

11. US 220 - Star-Briscoe-Candor Bypass. (Under Construction, HIP NUMBER R-80)

12. SR 1554 - Replace bridge over Little River (Under Construction, HIP NUMBER B-132)

13. SR 1349 - Replace bridge over Little River. (Fiscal year 1978, HIP NUMBER O-68)

14. NC 73, NC 24-27 - Construct two foot paved shoulders along back sides of roadway south to SR 1174. (Fiscal year 1985, HIP NUMBER R-624)

15. US 220 - Ulah to Steed. Four land divided facility on new location. (Fiscal year 1983, HIP NUMBER R-523)

16. NC 731 - Mount Gilead city limits to SR 1342. Reconstruct the existing two-lane roadway. (Fiscal year 1985, HIP NUMBER R-625)

17. Candor - NC 211 to existing curb & gutter section. Widen to curb & gutter section. (Fiscal year 1979, HIP NUMBER U-658C)

18. Troy - SR 133, Pearl Street. Improve drainage at intersection. (Fiscal year 1979, HIP NUMBER U-658R)

VI. DESIGN REQUIREMENTS

Design requirements for roads and highways vary according to the desired capacity and level of service to be provided. Thus, universal standards to be followed in design are not practical and each section must be individually analyzed.

The level of service is a function of the ease of movement experienced by motorists using the facility. The ability of a motorist to drive at a desired speed is dependent upon the physical design of the street; the amount and character of traffic control devices; the influence and character of traffic generated by abutting property; and imposed speed restrictions. The level of service is generally indicated by the over-all travel speed[1] experienced by traffic. Recommended minimum levels of service for roads and highways included in the proposed Montgomery County Thoroughfare Plan are given in Table 5.

Table 5. Desirable levels of service for roads and highways in Mongomery County

Facility	Overall Travel Speed During Peak Traffic Conditions
Major and Minor Arterials	50-55 MPH
Major Collector Roads	45-50 MPH
Minor Collector Roads	40 MPH

From the standpoint of driver convenience, ease of operation, and safety, it would be desirable to widen all existing roads and highways to provide a minimum lane width of 12 feet. However, when considering overall statewide needs and available highway revenues, it is found that these levels of improvement applied statewide would be impractical. It is necessary, therefore,to establish minimum tolerable widths for existing roads with respect to traffic demands which would be economically feasible. Table 6 gives the widths used in determing the existing lane deficiencies in the County.

---

[1] The overall speed is the total distance traveled divided by the total time required, including all traffic delays.

Table 6. Minimum Tolerable Lane Widths (in feet)

ADT	Principal Arterials	Minor Arterials	Collectors
Over 2,000	11	11	11
400-2,000	-	10	10
100- 400	-	10	9
Below 100	-	-	9

Using historic traffic volume trends, information obtained in the capacity deficiency analysis, and tolerable land width standards, rural road and highway improvements needed in Montgomery County were defined and are listed in the Appendix. Recommended pavement cross sections for roads to be widened were either 20 feet, 22 feet or 24 feet depending upon the anticipated traffic and function of the facility.

VII. IMPLEMENTATION

There are several tools which are available for use by a county to assist in the implementaton of a Thoroughfare plan. They are as follows:

State-County Adoption of Thoroughfare Plan

If requested, the Department of Transportation in cooperation with a county will cooperatively develop and mutually approve a county Thoroughfare plan. The mutually approved plan would serve as a guide to the Department of Transportation in the development of the road and highway system of the county. The approval of the plan by the county would enable subdivision regulations and zoning ordinances to be effectively used to assist in the implementation of the plan.

Subdivision Controls

The subdivision regulations requires every subdivider to submit to the county planning commission a plan of his proposed subdivision and requires that the subdivision be constructed to certain standards. Through this process, it is possible to require the subdivision streets to conform to the Thoroughfare plan and to reserve or protect necessary rights-of-way for projected roads and highways that are to become a part of the Thoroughfare plan. The construction of subdivision streets to adequate standards would reduce maintenance costs and would facilitate the transfer of the streets to the State Highway System.

Zoning

The zoning ordinance is an important tool in that it will regulate future land development and minimize undesirable development along roads and highways. The zoning ordinance can improve highway safety by requiring sufficient building setbacks to provide for adequate sight distances and by requiring off-street parking.

APPENDIX

TABLE 1

MONTGOMERY COUNTY TRANSPORTATION PLAN

ROADWAY AND SECTION	EXISTING CROSS SECTION		MINIMUM DESIGN YEAR PAVEMENT CROSS SECTIONS	DESIRABLE ROW	ULTIMATE DESIRABLE CROSS SECTION
	PAVEMENT	ROW			
1. US 220					
county line-Steed	24'	150'	Adequate	-	-
bypass-Emery	4LD[e]	300'	Adequate	-	-
Emery-county line	24'	90'	Adequate	120'	-
2. NC 109					
county line-TPL[a]	20'	100'	22'	120'	24'
TPL-MGPL[b]	20'-28'	60'-100'	24'	120'	24'
MGPL-county line	20'	60'	22'	120'	24'
3. NC 24-27					
county line-BPL[c]	24'	60'	Adequate	-	-
BPL-TPL	20'-24'	60'-100'	24'	120'	-
TPL-NC 109	22'-24'	60'-150'	4 lanes	250'	-
NC 109-county line	18'-24'	150'	24'	120'	-
4. NC 73					
except in MGPL	18'-20'	60'	20'	120'	24'
5. NC 211	22'-44'	90'	Adequate	120'	-
6. NC 731					
except in MGPL[b]	18'-22'	60'	20'	120'	24'
7. NC 134					
to TPL[a]	22'	100'	Adequate	Adequate	24'
8. US 220 Business					
Steed-Emery except BPL & SPL	24'-78'	90'-150'	Adequate	Adequate	-
9. SR 1002					
SPL[d]-county line	14'-18'		22'	100'	24'
0. SR 1005					
TPL-county line	18'-22'		20'	100'	24'
1. SR 1516					
US 220 business-SR 1005	16'		20'	100'	24'
2. SR 1003					
Emery-NC 73	16'-22		20'	100'	24'
3. SR 1509					
Candor-county line	16'-18'		20'	100'	24'
4. SR 1365					
SPL-SR 1364	18'		20'	100'	24'
5. SR 1364					
SR 1365-county line	18'		20'	100'	24'
6. SR 1340					
Okeewemee-SPL	18'		20'	100'	24'
7. SR 1323					
Okeewemee-TPL[a]	18'		20'	100'	24'
8. SR 1349					
SR 1348-SR 1311	16'-18'		20'	100'	24'

19.	SR 1311 SR 1349-SR 1306	16'	20'	100'	24'
20.	SR 1306	16'-20'	20'	100'	24'
21.	SR 1310 to TPL	16'-18'	20'	100'	24'
22.	SR 1303	16'	20'	100'	24'
23.	SR 1301 Coggins mine-county line	16'-20'	20'	100'	24'
24.	SR 1302	16'	20'	100'	24'
25.	SR 1150 NC 109-NC 24-27	16'-22'	20'	100'	24'
26.	SR 1134 NC 109-SR 1130	16'-18'	20'	100'	24'
27.	SR 1130 SR 1134-SR 1174	16'	20'	100'	24'
28.	SR 1128 to MGPL[b]	16'	20'	100'	24'
29.	SR 1111 NC 73-SR 1110	22'-30'	Adequate	100'	24'
30.	SR 1110	18'	20'	100'	24'
31.	SR 1188 MGPL[b]-SR 1110	18'	20'	100'	24'
32.	SR 1174	18'	20'	100'	24'
33.	SR 1543 NC 731-SR 1565	16'-22'	20'	100'	24'
34.	SR 1565 SR 1543-SR 1568	16'-20'	20'	100'	24'
35.	SR 1568 SR 1565-SR 1570	16'-20'	20'	100'	24'
36.	SR 1570 SR 1568-SR 1005	16'	20'	100'	24'
37.	SR 1519 SR 1005-US 220 Bus.	18'	20'	100'	24'
38.	SR 1578 SR 1005-SR 1519	18'	20'	100'	24'
39.	SR 1554 TPL[a]-SR 1519	18'-20'	20'	100'	24'
40.	SR 1557 SR 1519-BPL[c]	18'-20'	20'	100'	24'
41.	SR 1558 SR 1519-BPL	18'	20'	100'	24'
42.	SR 1505 SR 1509-SR 1500	18'	20'	100'	24'
43.	SR 1500 SR 1505-BPL[c]	16'-20	20'	100'	24'

[a] Troy Planning Limits
[b] Mount Gilead Planning Limits
[c] Biscoe Planning Limits
[d] Star Planning Limits
[e] Four-lanes divided

STATE LIBRARY OF NORTH CAROLINA
3 3091 00747 4588